

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A satellite network comprising:
backbone satellites configured to act as routers for data units transmitted through the network, the backbone satellites communicating with one another through inter-satellite links;
user satellites configured to connect with the network via the backbone satellites through access links; and
ground stations configured to connect to the backbone satellites through up/down links, wherein the inter-satellite links and the up/down links include directional transmissions and the access links include omni-directional transmissions from the user satellites.
2. (Original) The satellite network of claim 1, wherein at least two of the ground stations are coupled through terrestrial links.
3. (Original) The satellite network of claim 1, wherein the backbone satellites, user satellites, and ground stations communicate with one another using the Internet Protocol (IP).
4. (Original) The satellite network of claim 1, wherein the backbone satellites each further comprise:
a plurality of input/output devices that form the inter-satellite links, up/down links, and access links.
5. (Original) The satellite network of claim 1, wherein the backbone satellites dynamically form and break connections with one another based on relative locations of the backbone satellites to one another.

6. (Original) The satellite network of claim 1, wherein orbits of the backbone satellites include at least one of the backbone satellites in multiple ones of geostationary orbits, medium earth orbits, low earth orbits, highly inclined orbits, eccentric orbits, or Moliya orbits.

7. (Original) The satellite network of claim 1, wherein each of the backbone satellites further comprises:

- a forwarding engine;
- a processor coupled to the forwarding engine; and
- a random access memory coupled to the processor and the forwarding engine.

8. (Original) The satellite network of claim 7, wherein each of the backbone satellites further includes:

- a plurality of input/output devices that form the inter-satellite links, up/down links, and access links.

9. (Original) The satellite network of claim 7, wherein at least one of the backbone satellites further comprises redundant implementations of the forwarding engine, the processor, and the random access memory.

10. (Currently Amended) A method of adding a satellite into a satellite network, the method comprising:

- measuring position data of the satellite;
- determining, at the satellite, an orbital location of the satellite based on the measured position data;
- selecting a ground station with which to communicate based on the determined orbital location;
- receiving, from the selected ground station, at least one of location and orbital information of other satellites in the satellite network; and

transmitting, by the satellite, the location of the satellite to the selected ground station to add the satellite to the satellite network.

11. (Original) The method of claim 10, wherein selecting the ground station is based on a prestored list of ground stations and locations corresponding to the ground stations.

12. (Original) The method of claim 10, further comprising:
creating inter-satellites links with other satellites in the satellite network.

13. (Original) The method of claim 12, further comprising:
dynamically modifying the inter-satellite links based on changing orbital information of the satellite and the other satellites.

14. (Original) The method of claim 12, wherein the inter-satellite links are formed with directional receivers and transmitters.

15. (Original) The method of claim 12, wherein the inter-satellite links are formed between satellites in different orbits.

16. (Original) The method of claim 15, wherein the different orbits include at least two of geostationary orbits, medium earth orbits, low earth orbits, highly inclined orbits, eccentric orbits, or Moliya orbits.

17. (Original) The method of claim 12, wherein the satellite and the other satellites communicate over the inter-satellite links based on the Internet Protocol (IP).

Claims 18-22. (Cancelled)

23. (Currently Amended) A method of operating a satellite network including backbone satellites ~~and user satellites~~, the method comprising:

receiving position information from the backbone satellites, the position information being calculated by the backbone satellites based on data measured by the backbone satellites;

calculating network topology information based on the position information; and

creating inter-satellite links, via directional transmitters/receivers, between the backbone satellites based on the network topology information; and

communicating packet data through the satellite network over the inter-satellite links.

24. (Original) The method of claim 23, wherein the position information includes orbital information of the backbone satellites.

25. (Original) The method of claim 23, wherein the position information includes location information of the backbone satellites.

26. (Currently Amended) A method of operating a satellite network including backbone satellites and user satellites, the method comprising:

receiving position information from the backbone satellites, the position information including location information of the backbone satellites;

calculating network topology information based on the position information; and

creating inter-satellite links, via directional transmitters/receivers, between the backbone satellites based on the network topology information;

communicating packet data through the satellite network over the inter-satellite links; and

~~The method of claim 25, further comprising:~~

creating access links, via omni-directional transmitters/receivers, between the backbone satellites and the user satellites.

27. (Original) The method of claim 26, further comprising:
creating up/down links between the backbone satellites and ground stations.

28. (Original) A satellite comprising:
means for determining an orbital location of the satellite;
means for selecting a ground station with which to communicate based on the determined orbital location;
means for receiving at least one of location and orbital information of other satellites in the satellite network; and
means for transmitting the location of the satellite to the selected ground station.
29. (new) The method of claim 10, wherein the position data includes Doppler shift information measured by the satellite.
30. (new) The method of claim 23, wherein the position information includes Doppler shift information.